Unit – II

Overheads

Concept

Overheads, also termed as indirect or supplementary costs, are those costs which cannot be identified with a particular cost center or cost unit. Overheads are the aggregate of indirect material, indirect labour and indirect expenses. These indirect costs are incurred not for one product unit or cost center, but for multiple cost units or cost centers. The cost of overheads should be appropriately apportioned to these multiple cost units or cost centers at the time of determination of the total cost of different products.

Overheads may be classified on the basis of their nature, variability, function and other characteristics. A summary of the classification can be depicted as follows:

1. On the basis of NATURE or ELEMENTS

a) Indirect Material refers to that category of materials which do not form a part of the finished product or cannot be identified to the product conveniently. For example: consumable stores, loose tools, nuts, bolts, lubricating oil, threads, fuel, stationery.

b) Indirect Labour refers to the cost of labour which is not engaged directly for production of goods and services. For example: salary of supervisor, electrician, works manager, watchman.

c) Indirect Expenses are costs other than indirect materials and indirect labour which cannot be directly identified with a job or product. For example: rent, repairs,taxes, depreciation, insurance.

2. According to NORMALITY

a) Normal Overheadsare overheads which are expected to be incurred in attaining a given level of output in the normal course of business, and are thus, included in the cost of production.

b) Abnormal Overheads are generally not expected to be incurred in attaining a given level of output in the normal course of business, and are thus, charged to costing profit and loss account.

3. On the basis of CONTROLLABILITY

a) Controllable Overheads are those which can be controlled by executive action at the point of their occurrence.

b) Uncontrollable Overheads are those indirect expenses which are beyond the control of the management. Examples; factory rent, office salaries, depreciation and legal expenses. For example, cost of power used in a particular department can be controlled by the departmental manager but the share of general lighting costs in the factory cannot be controlled by him.

4. According to VARIABILITY

a) Fixed Overheads, also called period costs or capacity costs, remain fixed or constant in total despite changes in the volumes of production or sale. These costs are not affected during a given period by a change in output provided such change in output is not substantial in nature. For example: rent, interest.

b) Variable Overheads vary proportionately i.e. in the same ratio with the production and sales volume. They increase in total with the increase in volume and vice versa. For example, sales commission

c) Semi-variable Overheads are neither completely fixed nor entirely variable. They vary disproportionately with the change in the volume of output. For example, depreciation will increase due to wear and tear of machine if output is doubled, but the increase in depreciation will not be proportionate to the increase in the output.

5. On the basis of FUNCTION

a) Factory Overheads, also known as production or works or manufacturing overheads, are indirect expenses incurred in converting raw material into finished goods. For example, power, factory rent, factory insurance

b) Administration Overheadsare incurred in connection with the general administration of the company. For example, office salaries, office rent, printing and stationery, telephone expenses

c) Selling & Distribution Overheads

• Selling Overheads are incurred for creating demand, attracting potential customers and retaining old customers. For example, free gift, advertisement

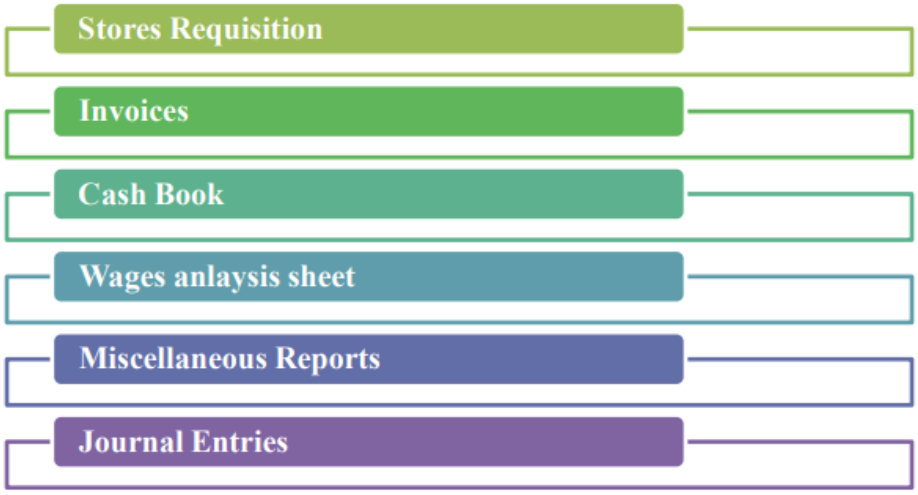
• Distribution Overheads are incurred in maintaining stocks and delivering the goods to customers. For example, carriage and freight out, warehouse expenses

This functional classification is a conventional method of classifying overheads so as to ascertain the cost of each function for controlling costs.

Collection of Overheads –

Collection of overheads means the pooling of indirect items of expenses from books of account and supportive/ corroborative records in logical groups having regards to their nature and purpose. Overheads are collected on the basis of pre-planned groupings, called cost pools. Homogeneity of the cost components in respect of their behaviour and character is to be considered in developing the cost pool. Variable and fixed overheads should be collected in separate cost pools under a cost centre. A great degree of homogeneity in the cost pools are to be maintained to make the apportionment of overheads more rational and scientific. A cost pool for maintenance expenses will help in apportioning them to different cost centres which use the maintenance service.

SOURCES OF OVERHEAD INFORMATION

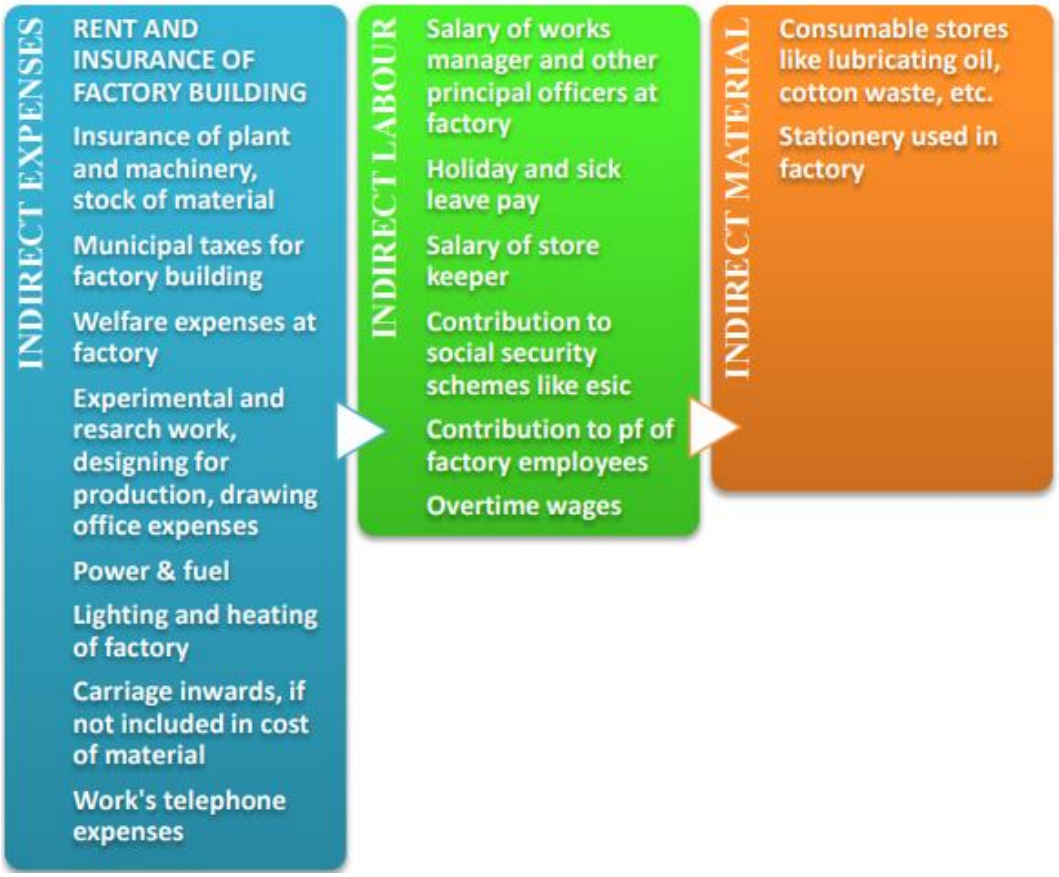


Information regarding overheads can be collected from any or all of the above sources like cost of stores can be computed from the invoices for store purchases with the purchase department and wages analysis sheet will give a fair picture of the indirect wages incurred.

Before understanding the treatment of various items of overheads, it is imperative to identify the inclusion of these itemsunder respective categories of overhead. Firstly, factory overheads and their treatment have been elucidated.

FACTORY OVERHEADS

Works overheads or manufacturing overheads refer to indirect factory-related costs that are incurred when a product is manufactured. They consist of :



Some factory overheads have been discussed in detail as follows:

1. DEPRECIATION

Depreciation implies diminution in value of fixed asset arising as a result of wear and tear because of its usage &/or lapse of time. In cost accounts, to find the true cost of manufacturing product, depreciation must be charged.

Some methods of charging depreciation are:

- Fixed Installment Method wherein a fixed amount of depreciation, calculated using original cost, scrap value and expected life, is charged year after year.

- Machine Hour Rate Method wherein the life of the asset is estimated in terms of hours. The rest is same as the previous method. The original cost less scrap value is divided by the life of the asset to calculate the amount of depreciation.

- Diminishing Balance Method charges depreciation at a fixed rate on the reducing balance (i.e. cost less depreciation) every year.

As compared to above methods, diminishing value method charges higher amount of depreciation in initial years.

- Revaluation Method calculates depreciation by comparing the value of the asset at the beginning of the year with that at the end of the year. It is usually used in case of livestock, loose tools etc.

- Replacement Cost Method charges depreciation at affixed rate on the replacement value of the asset so as to provide for market value of asset on expiry of useful life and consider the current costs of production.

Note: In case an asset's depreciation value ceases to exist even if the asset is in good working condition, it is advisable to charge a reasonable amount of depreciation in cost accounts and this charge should be transferred to costing profit and loss account like other abnormal profit or loss. Also, if a machine is discarded before the expiry of its useful life because of its premature obsolescence, then the difference between book value and value realized on sale should be considered as abnormal loss and transferred to costing profit and loss account.

2. COST OF DEFECTIVE WORK

Defectives are said to be normal when they are inherent in the nature of manufacturing process. In case of normal defectives, the cost of their rectification should be spread over the entire output. In other words, it is included in cost of production. If the number of defectives is more than the normal limit or there are abnormal defectives, then the cost their rectification is directly transferred to the Costing Profit and Loss Account.

3. PROVISION FOR OBSOLESCENCE

A company may envision that the commercial life of the plant or machinery might be less than the estimated life used for calculating depreciation, then provision for obsolescence can be made. In such a case, this provision is treated as additional depreciation and included in factory overheads. If it is only a precautionary measure, then it should be excluded from cost accounts as it is an appropriation of profits.

4. EXPENSES ON REMOVAL AND/OR ERECTION OF MACHINE

Such expenses are neither recurring expenses nor are a normal feature of working. Thus, they cannot be treated as cost of production.

The expenses of installation or erection of a new machine arecapitalised and absorbed in the cost of production through depreciation. In case of dismantling and re-erection of machine due to change of location, such expenses may be treated as overhead.

If a machinery has been permanently dismantled before the expiry of its life because of its inadequacy or redundancy so as to accommodate new asset , then the difference between the cost and written off depreciation should be treated as abnormal loss. This loss after deducting therefrom any amount realised from the sale of machinery may be charged either in the same year or spread to the balance of the life of the machinery.

If such expense is incurred in any other case apart from those stated above, then such expense should be debited to costing profit and loss account.

5. EXPERIMENTAL EXPENSES

In case a company has incurred experimental expenses for particular job or order, they should be charged directly to that job or order while if the same have been incurred for the organization as a whole, then they should be added to works overhead.

6. RENT FOR FACTORY BUILDING

When a factory building is owned by the company, financial accounts do not record any amount as rent while in cost accounts, a reasonable charge should be included in works overhead so as to facilitate comparison.

7. IDLE FACILITIES/CAPACITIES

Firstly, it is important to understand the difference between idle facility and idle capacity. The former refers to idle plants, machines or services while the latter refersto that part of the capacity of the plant or equipment which is not actually or effectively utilized for production purposes, because of unavoidable reasons like lack of demand, non-availability of resources or avoidable faulty planning.

Idle facilities or capacities do not reduce the fixed cost burden like rent, insurance, etc. The treatment of such costs can be done as follows:

a) If idle time of plant is due to unavoidable reasons, such costs should be included in works overheads and charged to utilized capacity by using a supplementary rate.

b) If the facilities are idle due to abnormal reasons like trade depression, then consequent costs should be charged to costing profit and loss account.

c) In case reasons are avoidable, such costs should be charged to costing profit and loss account.

8. INTEREST ON CAPITAL

The treatment of interest on capital in cost accounts is a controversial issue.

Arguments in Favour of Inclusion of Interest in Expenses:

(a) Interest cost is similar to cost of wages. Wages are paidfor the use of labour while interest ispaid for the use of capital. So, while determining the total cost, both wages and interest should be included in the cost of production.

(b) Comparison of cost will give misleading results if interest is not taken into consideration. For example, a timber merchant may buy standing trees and season the timber himself, waiting a number of years before he can use or sell it while another merchant may buy his timber already seasoned and, therefore, ready for use or sale. The second merchant will pay a much higher

price. For the purpose of cost comparison, the former merchant should add interest for the waiting period.

(c) It is impossible to compare profits on different jobs requiring different amounts of capital or requiring different periods for completion without including interest. For example, Job 1 completes in three months with Rs. 10,000 capital yieldingRs. 1500 as profit, while Job 2 requires Rs. 25,000

capital and is completed in four months yieldingRs. 2000 profit. Charging interest at 12 per cent, the profit on the first job is reduced to Rs. 1200 and on the second job to Rs. 1250. This facilitates better comparison.

(d) Decision regarding replacement of human labour by machinery or replacement of an existing machine by a new one will not be appropriate without adequate consideration of interest.

(e) Comparison of cost of articles with substantial valuedifference will be inappropriate without inclusion of interest as amount of capital required for each article will be significantly different.

(f) Interest inclusion is important in case of heavy and fluctuating stocks as they require different amounts of capital to maintain.

(g) While submitting tenders or quoting prices, interest on money required to undertake the job should be given due importance otherwise the price quoted may leave little margin as may be sufficient to pay interest only, leaving no profit.

Arguments Against the Inclusion of Interest in Expenses:

(a) Payment of interest is a matter of internal finance as it depends purely on the company's financial policies. A firm may work mostly with proprietor's capital or have more borrowed capital. The amount of interest would differ in each case and inclusion of such interest may give erroneous results.

(b) Identifying the amount of capital on which interest should be calculated is difficult. According to some people, interest should be allowed only on the fixed capital, as working capital is fluctuating. If interest has to be allocated to the various departments, the process becomes very tedious as it will require maintenance of complete and accurate records of capital invested, both fixed and working, in each department periodically.

(c) It is also difficult to determine a proper rate of interest, as it varies depending on a host of factors such as risk, period of maturity, bank rate, industry, nature of work, etc.

(d) Allowing interest on capital which is not borrowed will inflate the cost of production leading to over valuation of stock. However, reserves can be maintained against the unrealised profit.

(e) Inclusion of interest is not advisable when turnover is rapid and cost of each unit produced is small.

Conclusion: Inclusion of interest is theoretically sound but considering the associated practical difficulties, interest should be excluded from costing records, even the amount actually paid.

However, due consideration should be given to interest on capital while taking managerial decisions.

9. RESEARCH AND DEVELOPMENT COSTS

"Research cost is the cost of seeking new or improved products, applications of materials or methods. Development cost is the cost of the process which begins with the implementation of the decision to produce a new or improved product or to employ a new or improved method, and ends

with the commencement of formal production of that product or by that method." As defined by CIMA, London.

Research may be of two types, viz, fundamental or basic research and applied research.

- Fundamental research is done to investigate possibilities of technological developments and improving stock of basic knowledge in the know-how of technical process. It aims at increasing the knowledge of the technicians. Costs involved in basic research are recurring in nature. Expenses incurred on such fundamental researches are treated as manufacturing overheads.

- Applied research is concerned with application of basic research knowledge for introduction for the introduction or improvement of products, production methods or techniques.

PURPOSE OF EXPENSES ON APPLIED RESEARCH	TREATMENT
Improvement in the existing products and/or methods of production	-If incurred for a particular period, treated as manufacturing overhead of that period -If ear-marked for specific product, charge directly to the product
Searching new products or new methods of production	- Allocate directly to specific research project - If the research project is a failure, debit such cost to Costing Profit and Loss Account - If the research project is a success, debit to development cost

The development costs may be charged to specific products as revenue expenditure of the period in which they are incurred. In case of heavy costs, they can be charged as deferred revenue expenditure over a period, generally not exceeding three years. If product is abandoned at a later stage, the balance not written off may be charged to costing profit and loss account.

10. PRE-PRODUCTION COSTS

These costs are incurred in making trial production run before formal production, generally when a new product line is taken up or factory is new and in process of setting up. Such costs are

treated as deferred revenue expenditure and charged to future cost of production (except those which have been capitalized) as no formal or established production exists.

11. ROYALTY AND PATENT FEES

Royalties and patent fees have to be included in expenses. If they are based on quantity of output, then they will be part of manufacturing cost as a direct chargewhile if they are based on sales, they will form part of selling expenses. This is applicable on excise duty as well.

12. MAINTENANCE AND REPAIRS

The cost of maintenance and repairs can be known with ease if they are carried out by outside firms but quite often big manufacturers maintain their own repairs and maintenance department. For ascertaining the amount in such a case, an account for each repair job undertaken has to be separately opened under distinctive number for series known as “Service Orders”.

Works manager sanctionsthe repairs to be undertaken and then costing is done. The aggregate of material, labour and a proportionate charge for factory expenses is included in the factory expenses. Alternatively, the cost of repairs and maintenance facilities can be charged to various departments according to machine hours run.

13. FUEL AND POWER

The total charges for power consumed can be easily ascertained if electricity is bought from some outside authority. But for companies having their own generating stations, the cost of materials used, wages of working in the power house, other direct expenses and an equitable share of other overheads such as for general factory administration, stores etc. will be included in factory overheads as “fuel and power”. Such cost should then be apportioned to production departments according to the horse power of machinery installed.

14. TOOL COSTS

Tools can be small or large. Cost of large tools is generally capitalized and appropriate depreciation is charged in cost accounts as factory overheads. Small tools are mechanical appliances used in a work shop.Cost of small tools is generally charged to all departments on the basis of actual issues. Small tools can also be capitalized and depreciation thereon can be charged if their life can be ascertained or revaluation method of depreciation may be used to know the amount of depreciation to be charged as factory overheads. But this basis is not very desirable.

15. INSURANCE

The treatment of insurance differs from case to case.

a) Insurance of plant and machinery, buildings and equipment should be allocated to particular departments or cost centres as items of overhead costs.

b) Insurance expenses on warehouse stock are treated as distribution overhead.

c) Insurance premium at the time of purchase may be added either in the value of raw materials or asset purchased.

d) Insurance expenses on stock of raw materials are charged to manufacturing overhead.

e) Insurance premium paid for safeguarding from burglary etc. is treated as administration overhead.

f) Insurance premium paid on the fixed assets should be directly allocated. If not, then it may be apportioned on the basis of number or area or values or cubic capacity.

g) Accident insurance expenses should be apportioned on the basis of total wages,by assigning appropriate weights to cost centres which are more prone to accidents.

16. INCENTIVES TO INDIRECT WORKERS

Direct workers are given incentives for better performance and efficiency. Similarly, indirect workers, i.e. those who are not directly engaged in production process, should also be provided with suitable monetary incentives. This compensation to indirect workers will be considered under factory overheads.

17. LEAVE TRAVEL ASSISTANCE

Cost of leave travel assistance provided to direct workers should be charged to direct labour cost while the same offered to indirect workers will be charged to factory, office & administration or selling & distribution overheads as the case may be.

18. CARRIAGE AND CARTAGE EXPENSES

Such expenses are incurred in the process of movement of materials and goods from one place to another. Their treatment can be explained as follows:

a) If incurred specifically for certain raw materials, then they should be treated as direct charge. However, if they cannot be conveniently identified to specific raw materials, then they are charged as works overheads.

b) If incurred for indirect material, they are charged as works overheads.

c) If incurred for distribution of finished goods, they are treated as distribution overheads.

d) If incurred under abnormal situations, then they are charged to costing profit and loss account.

19. ANNUAL BONUS

The amount of payment of bonus under legal provisions is considered as cost of production while if the same has been paid voluntarily by the company, the it is charged to costing profit and loss account.

20. FRINGE BENEFITS

Fringe benefitsare payments in addition to normal wages and other allowances to increase employees' morale, loyalty and stability. Such cost cannot be allocated direct to the cost units

but may be allocated to the particular department or cost centre in which the employees are working. If cost of fringe benefits is substantial, they should be charged to production by way of a supplementary wage rate in case of direct workers. Else, they are taken as part of overheads.

21. TRAINING EXPENSES

Training costs are apportioned to different cost centres on the basis of number of trainees or direct wages. If the trainees perform productive work, a part of estimated cost is charged to the production order concerned. If the training expenses are incurred on office and administration or selling and distribution, then such expense should be charged to the respective overheads.

22. COST OF PATTERNS AND DYES

Cost of patterns and dyes are treated as direct charge if they are incurred for a particular job/order. In other cases, the annual depreciation is calculated and the same is included in factory overheads.

23. LABOUR WELFARE EXPENSES

The company should record all labour welfare expenses like canteen, hospital, etc. under Welfare Department costs and then apportion the same to production cost centres on the basis of total wages or number of employees.

24. FINES REALISED FROM WORKERS

Fines realised from workers cannot be treated as income for the concern and should be credited to a separate account as per provisions of the Payment of Wages Act to be utilisedfor the welfare of the workers. The receipt and expenditure from this fund are excluded from cost accounts.

25. TOWNSHIP MAINTENANCE COST

Costs incurred by companies located in rural or isolated places for the purpose of providing residential, communication, marketing or other facilities are termed as township maintenance costs. These costs are apportioned between administrative and staff welfare costs.

26. MATERIAL HANDLING COST

Expenses incurred for handling materials and for their movement from arrival to delivery for production, like inspection costs, etc. expenses for weighing of materials at different stages etc. are included in material handling cost.

When such cost is incurred for a specific material, then it is treated as a part of material cost while if the incurrence covers a large number of materials, then it is treated as an item of production overhead, to be apportioned on the basis of value, weight and value of materials or number of material requisitions handled.

In other cases, this expense should be treated as works overhead and should be apportioned on the basis of value, volume, weight, or number of requisitions handled.

OFFICE AND ADMINISTRATION OVERHEADS

Office and administration overheads refer to costs relating to formulating the policy, directing the organisation and controlling operations. They consist of:

Some office and administration overheads have been discussed in detail as follows:

1. AUDIT FEES

Fees paid to auditors, statutory or internal is included in office and administration overheads. Even accrued expenses are to be taken as overheads.

The degree of fluctuation in office expenses is much less than that of works expenses. They can be estimated easily on the basis of last year's profit and loss account after making due allowance for known or anticipated changes.

2. FINANCING CHARGES FOR ACQUISITION OF FIXED ASSETS

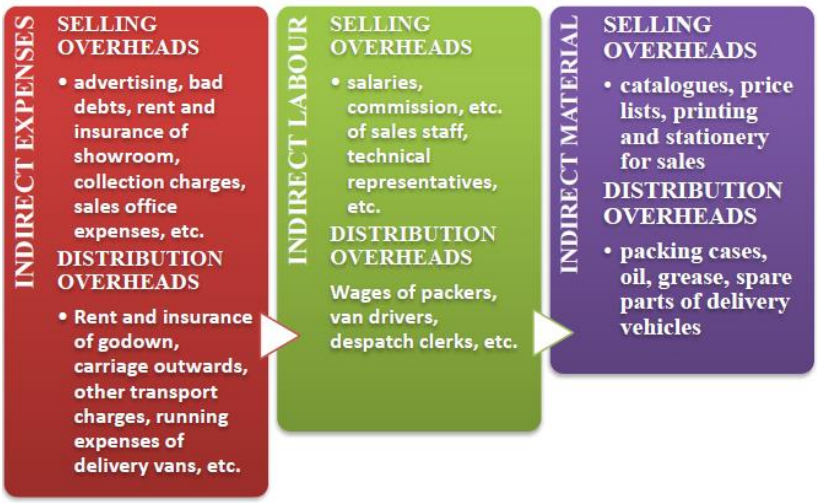
Interest on loan, debentures, etc. payable for acquisition of fixed assets are termed as the financial charges. These charges, being purely financial in nature can be excluded from cost accounts. The company may also decide to include them as part of cost. If these charges have been incurred for purchasing materials to be stored for a long time like for seasoning, then this cost should be taken as cost of materials. Notional interest on owned capital and actual interest paid on borrowed funds will be taken as office and administration overheads.

3. NOTIONAL SALARY FOR PROPRIETOR'S SUPERVISION

Cost accounts records both actual and notional charges. Notional salary means amount that would have been paid to another person if the proprietor was not working in the organization himself. This notional salary should be included in office and administration overheads.

SELLING AND DISTRIBUTION OVERHEADS

Selling overheads include the cost incurred in promoting sales and retaining customers, while the distribution overheads constitute the cost of the process which begins with making the packed product available for dispatch and ends with making the reconditioned returned empty packages available for re-use. They consist of:



Some selling and distribution overheads have been discussed in detail as follows:

1. CATALOGUES AND PRICE LISTS

The cost of printing catalogues and price lists should be transferred to a separate account and charged evenly over the period during which they are used.

2. BAD DEBTS

Credit sales, inherently, result in some amount of bad debts. Expected bad debts upto a certain extent are included in selling overheads. If the amount is abnormal and substantially large, it should be written off to costing profit and loss account.

3. PERIODICAL EXHIBITIONS EXPENSES

Such expenses are treated as selling overheads and in case the befit accruing from such expenses spans the period between two exhibitions, then it should be treated as deferred revenue expenditure and apportioned over the expected life of benefit.

4. MARKET RESEARCH

Cost of market research done for a specific product is included in the cost of that product and treat it as deferred revenue expenditure over the years during which its benefit is expected to accrue. If expense has been incurred to study market conditions and identify potential of market, it should be apportioned over different products on the basis of sales.

5. PACKAGING COSTS

The cost of container without which the product cannot be sold is included in direct material cost. For example, without bottle, perfume cannot be sold. If packaging has been done for attractiveness, they are treated as advertising and thus included in selling overheads while if the same has been done for safe delivery of goods, it is distribution overheads..

6. DISCOUNTS AND REBATES

Discount can be trade discount or cash discount. Trade discount is deducted from the cost of purchase or sales, as the case may be while cash discount being purely financial in nature is excluded from cost accounts. Rebate is generally given for early payment and is thus included in cash discounts.

7. SUBSCRIPTIONS AND DONATIONS

Subscriptions are normally done to welfare schemes or institutions while donations generally refer to charity. Subscription is treated as works overhead if it is for welfare agencies from which workers derive benefit while trade subscription or subscription to mercantile agencies helping in finding the financial position of prospective customers are treated as selling overheads.

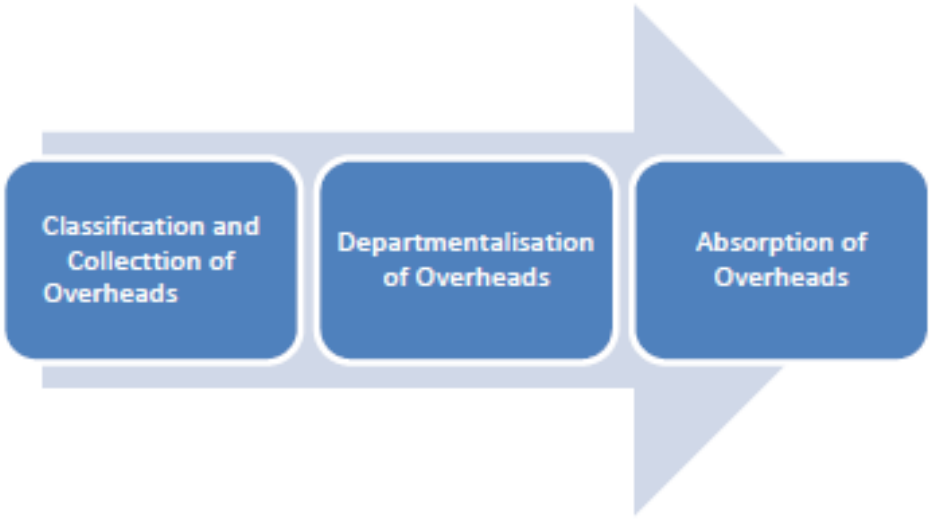
8. AFTER SALES SERVICE COSTS

These costs should be charged to different products on the basis of sales achieved.

OVERHEAD DISTRIBUTION

Overhead distribution is the most complex task in the cost accounting because there is no clear base is available to distribute the overheads. Overhead distribution means assigning the cost of indirect material, indirect labour and indirect expenses to a production department or service department.

There are three stages involved in the distribution of overheads



1. Classification and Collection of Overheads: Classification and codification is the pre-requisite for collecting the overheads. After classifying overheads as factory, office and selling, items covered by each category will be grouped under suitable account headings. Collection of overheads can be done from the following sources:

a) For collecting the expenses of rent, insurance and other expenses invoice can be used.

b) Journal entries are also a source of collecting the overheads.

c) Store requisitions are used to collect the indirect materials.

d) Wage sheets are used to collect the indirect labour.

Allotment of codes to individual heads of expense is termed as codification of overheads. Short description will be given to the lengthy heads. Codes are useful in the computerized system of accounting. Codification can be done with the help of following methods:

(i) Numerical Method (ii) Alphabetical Method (iii) Alphabetical-cum-numeric method

2. Departmentalization of Overheads: it is the process of allocation and apportionment of different overheads to various departments or cost centers. Departments majorly are divided in two types namely production and services.

Difference between Allocation and Apportionment

Allocation	Apportionment
Assignment of particular cost to a particular department or cost center is called as allocation.	These costs are common to various departments and cannot be charged to a particular department or cost center.
Allocation deals with whole items of costs.	Apportionment deals with proportions of items of costs.
No base is required for allocation of cost to a department, it is a direct process.	A equitable base is required for apportionment of cost to the production or services department.

3. **Absorption of Overheads:** it is the process of charging of overheads of a cost centre to different cost units in such a way that each cost unit bears an appropriate portion of its share of overheads. This is done by means of overhead rates.

APPORTIONMENT AND RE-APPOTIONMENT OF OVERHEADS

Production and Service Department

Departments which are involved in the manufacturing the goods from raw material are called as the production departments like; Spinning department, weaving department, Finishing etc. while services departments are involved in rendering services to the production departments like purchasing department, stores department, security department, etc.

Principles of Apportionment

Apportionment should be based on the following principles:

1. Potential benefit taken by the department.

2. Ability to pay method

3. Direct or specific criteria method

4. Survey method

Basis of Apportionment

Overhead Cost	Basis of Apportionment
Rent Lighting and heating Fire precaution service Air conditioning	Floor Area or Volume of the department
Fringe Benefits Labour welfare expenses Time keeping Personnel office Supervision	No. of Workers
Compensation to workers Holiday pay ESI and PF contribution	Direct Wages
Depreciation of plant and machinery Repairs and maintenance of plant Insurance of inventory	Capital value
Power/ steam consumption Managerial salaries	Technical advice by the experts
Electric power	Horse power of machine, or number of machine hours, or value of machines

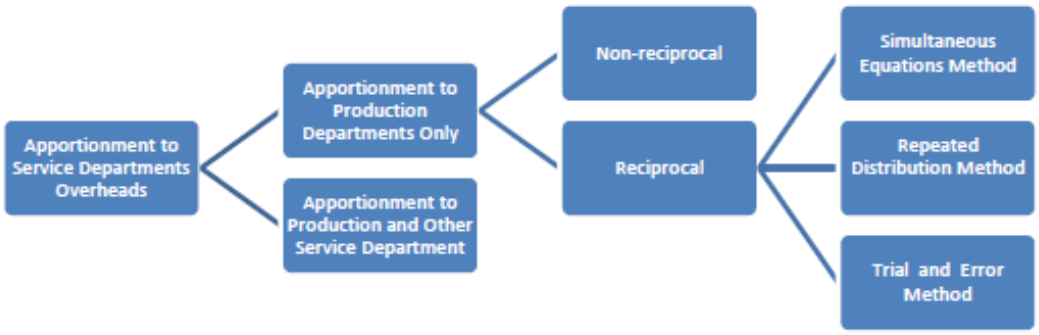
RE-APPORTIONMENT OF SERVICE DEPARTMENT COSTS (SECONDARY DISTRIBUTION)

Once overheads are allocated and apportioned to the production and service department then totaled overheads allocated to the service department should be allocated to the cost center or production department. Ultimately costs is to be charged to the production department only, this process of distributing overheads of services department in the production department is called Re-apportionment.

The method of re-apportionment of service department costs is similar to apportionment of overheads discussed earlier. Some of the important bases of apportionment of service department costs to production departments are as follows:

Service Department	Basis of Apportionment
Store keeping department	Number of material requisitions, or value/quantity of materials consumed in each department
Purchase department	Value of materials purchased for each department, or number of purchase orders placed
Time-keeping department and payroll department	Number of employees, or total labour or machine hours
Canteen, welfare and recreation services	Number of employees, or total wages
Maintenance department	Number of hours worked in each department
Internal transport service	Value or weight of goods transported, or distance covered.
Inspection department	Direct labour hours or machine operating hours
Drawing office	No. of drawings made or man hours worked

Thus, the cost of service departments are apportioned on the basis of service rendered, the benefits received by the beneficiary departments.



Apportionment to Production as well as Service Departments

Apportionment of expenses of service departments only to production departments is not sufficient because in reality services departments also provide services to the other service departments. For example; electricity department provides power not only to the production departments but also to services department like canteen, maintenance department and to other non-production departments. Apportionment can be done on the reciprocal as well as non-reciprocal basis:

Apportionment on Non-reciprocal Basis

When a department is only providing services to the other departments but not receiving any kind of services from the service provider department or when services are not inter-dependent.

Apportionment on Reciprocal Basis

When a department is not only providing services to the other departments but also receiving services from the service provider department or when services are inter-dependent on each other

For apportionment on reciprocal basis three methods are available:

1. Simultaneous equation method

2. Repeated distribution method

3. Trial and error method

1. Simultaneous Equation Method: according to this method the amount of overhead of each production department is obtained by solving simultaneous equations.

2. Repeated Distribution Method: according to this method cost service department should be apportioned to other service departments, production as well as service, according to prefixed percentage. The process is repeated until the total costs of the service departments are exhausted or the fiqures become too small to matter.

3. Trial and Error Method: this method is useful where two or three interlocked service cost centre involved. In case of this method the cost of one service cost centre is apportioned to another service cost centre. The cost of another service centre plus the share received from the first cost centre is again apportioned to the first cost centre. The process is repeated till the amount to be apportioned becomes negligible

ABSORPTION OF OVERHEADS

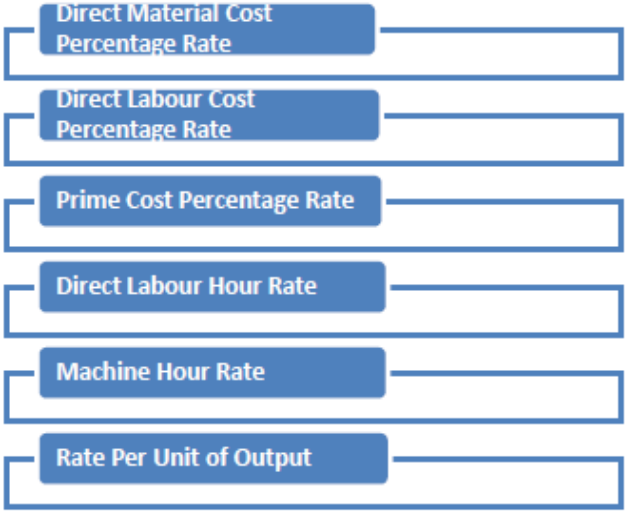
Absorption refers to the process of recovering allocated cost to a particular cost centre by the units produced in that cost centre.

Overhead Rate

The apportionment of overhead expenses is done by adopting suitable basis such as output, materials, prime cost, labour hours, machine hours etc. In order to determine the absorption of overhead in costs of jobs, products or process, a rate is calculated and it is called as "Overhead Absorption Rate" or "Overhead Rate." The overhead rate can be calculated as below:

Overhead Absorption Rate=Overhead Expenses / Total Quantity or Value

Methods of Absorption of Production Overheads



1. **Direct Material Cost Percentage Rate:** It is a percentage of overheads over direct material cost. Formula for calculating Direct Material Cost Percentage Rate is as follows:

$$\text{Direct Material Cost Percentage Rate} = \frac{\text{Total Overheads}}{\text{Direct Material Cost}} \text{ X } 100$$

2. **Direct Labour Cost Percentage Rate:** It is a percentage of overheads over direct labour cost. Formula for calculating Direct Labour Cost Percentage Rate is as follows:

$$\text{Direct Labour Cost Percentage Rate} = \frac{\text{Total Overheads}}{\text{Direct Labour Cost}} \text{ X } 100$$

3. **Prime Cost Percentage Rate:** It is a percentage of overheads over prime cost. Formula for calculating Prime Cost Percentage Rate is as follows:

$$\text{Direct Prime Cost Percentage Rate} = \frac{\text{Total Overheads}}{\text{Prime Cost}} \text{ X } 100$$

4. Direct Labour Hour Rate: This is a rate per hour and not a percentage rate. It is obtained by dividing the total production overheads by the total number of direct labour hours for the period:

$$\text{Direct Labour Hour Rate} = \frac{\text{Production Overheads}}{\text{Direct Labour Hours}}$$

5. **Machine Hour Rate:** Machine hour rate is the overhead cost of running a machine for one hour. This rate is obtained by dividing the amount of factory overheads apportioned to a machine by the number of machine hours for the period under consideration.

$$\text{Direct Material Cost Percentage Rate} = \frac{\text{Total Overheads}}{\text{No. of Machine hours}}$$

6. **Rate Per Unit of Output:**This is the simply the total overheads of a department over number of units produced.

$$\text{Direct Material Cost Percentage Rate} = \frac{\text{Total Overheads}}{\text{No. of Units Produced}}$$

TYPES OF OVERHEAD RATES

Various types of overheads rates are applied according to the nature, objective of the business organisation:

1. Actual and Predetermined Rates:

Overheads can be calculated only when expenses actually incurred. Actual data available regarding overheads is called as actual overheads. Actual overheads can be calculated as follows:

$$\text{Actual Overheads Rate} = \frac{\text{Actual Overheads}}{\text{Actual base}}$$

On the other hand, when rate or overhead is based on the estimated overheads is called pre-determined overhead rate. Pre-determined overheads can be calculated as follows:

$$\text{Pre} - \text{determined Overheads Rate} = \frac{\text{Budgeted Overheads for the Period}}{\text{Budgeted base for the period}}$$

Pre-determined rates are helpful in the preparation of tenders, quotations and deciding the selling price of the products.

Blanket and Multiple Rates

Blanket overhead rate is a common rate for the entire factory. This can be calculated as follows:

$$\text{Blanket Overheads Rate} = \frac{\text{Total Overheads for the Factory}}{\text{Total Number of Units of Base for the Factory}}$$

Multiple Overhead Rates

Multiple overhead rate refers to the calculation of various rates for different departments or cost centre etc.

Accounting Treatment of Under and Over-Absorption

Three methods of accounting treatment of under absorption and over absorption are as follows:

1. Use of Supplementary Rates: the supplementary rate is adopted when the amount of under or over absorbed overheads is quite large, a supplementary rate may be found out. The cost of each job, order or process may be adjusted by applying this supplementary rate. The rate may be calculated as follows:

Supplementary Rate=Amount of over or under - absorbed overheads / Actual Base

In case of under absorbed overheads the rate is considered as positive, while in case of over-absorption of overheads, it is termed as negative. In case of under-absorption the cost of the job or product is increased by adding it to overheads charged on the basis of a positive supplementary rate and in case of over-absorption the cost of the job or product is decreased by deducting the extra amount of overheads charged by applying a negative supplementary rate.

2. Carrying Over of Overheads:The amount of over or under absorption is carry forward to the next year. This method may be adopted in situation where the normal business cycle extends for more than one year. This method is not very prevalent in the industry.

3. Writing off to Costing Profit and Loss Account: In case the amount of under or over-absorbed overhead is very small it is not worthwhile to use supplementary may be written off to Costing Profit and Loss Account. If due to some abnormal factors, the amount of under or over absorbed is large it should be transferred to Profit and Loss Account.